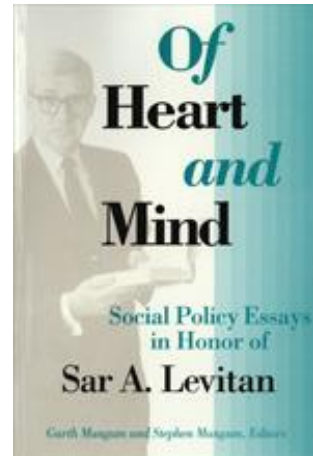




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CHAPTER 15

What Should Be Our Human Capital Investment Policy?

James J. Heckman

While we did not always or even often agree on matters of economic policy, Sar Levitan and I exchanged views on both economic policy and econometric methodology. On several occasions, we discussed the changing labor market for unskilled labor and what the proper role was for government policy. This paper records my side of our conversations. I make six points.

First, I discuss the magnitude of the human resource problem confronting the American economy and the size of investments required to solve the problem. Second, I comment on the general ineffectiveness of current government training policies. Third, I comment on the general effectiveness of private sector training. Fourth, I discuss the conflict between economic efficiency and pursuit of the work ethic. Fifth, I consider a broader array of policy options including extensions of the tax code and revisions of educational subsidies. Finally, I distinguish between the long view and the short view in approaching human resource problems.

Presently, the economy has a large group of unskilled workers, many of whom can be trained to be skilled labor only at a prohibitively expensive cost. In an era of tight budgets, it is far from obvious that investments in such workers are justified on any but political grounds. The real cost of such investment is the diversion of investment away from the young and the more trainable for whom a human capital strategy is likely to be more effective and for whom it is likely to produce favorable outcomes in the long run. Missing from most discussions of

job training is any discussion of the rather convincing evidence that investment is most profitable when it is made in the young.

Also, missing from current discussions is any consideration of priorities or the need to prioritize. In an era of tight government budgets, it is impractical to consider active investment programs for all persons. The real question is how to use available funds wisely. Government investments have not been shown to be effective in any meaningful cost/benefit sense for severely disadvantaged adults or older workers. For these groups, wage subsidies may be more effective tools for keeping persons employed than skill investment programs. The available evidence supports the policy proscription: Invest in the young; subsidize the old and the severely disadvantaged.

There is also a strong presumption in current discussions that investment in persons should be supplied by the government sector. This leads scholars of human resource problems to ignore a potentially important role for tax incentives in encouraging training by private firms to raise the demand and wages of labor. The evidence suggests that the returns to firm-supplied investment in human capital are larger than the returns to government training. This alone would justify greater reliance on the public sector. However, the better performance of private firms may be due to the lower skill level of trainees in the government programs. Evidence of their lower skills does not vindicate continued investment in such persons. No investment may be the best short-run strategy for low-skill adults, contrary to a central implicit premise of current job training strategies.

The New American Labor Market

There is much evidence to support the view that wage gaps have widened across the skill levels. In purchasing-power-constant or deflated dollars, male high school graduates earned 4 percent less per week in 1989 than in 1979. Male high school dropouts earned 13 percent less per week than in 1979. In contrast, male college graduates earned 11 percent more per week (Blank 1994). These comparisons widen further if we consider annual earnings. By any measure, labor incomes for men have become more unequally distributed. For women,

the story is somewhat different. The real weekly earnings of female high school graduates have risen but the rise has been even greater for female college graduates.

For both men and women, inequality of labor incomes has risen. The returns to schooling and skill have increased. The relative earnings of workers at the bottom of the skill distribution (less than high school graduate) have definitely declined for persons of either gender. Youth have been hit hardest in the shifting market for skills.

A corollary phenomenon is the decline in labor market activity, especially among the unskilled. Labor force measures show increasing joblessness and longer unemployment spells for workers at all skill levels. Particularly problematic are less-skilled youth (those with high school education or less) who appear to flounder in the market for years before they find stable jobs. These youth are a source of major social problems. Teenage pregnancy, crime, and idleness are on the increase in most areas. It is very likely that diminished labor market opportunities for youth help to create these problems.

The problem of a deteriorating market for unskilled or semiskilled workers is not solely a problem of youth. Displaced adults, primarily factory workers, are a major concern. Middle-age workers displaced from high-wage jobs are at a major disadvantage in the new market for labor that has emerged since many of these workers first took their jobs. Displaced workers constitute 10-20 percent of the unemployed, or roughly 1 to 2 million workers. Recent evidence on the patterns of earnings losses experienced by workers displaced by mass layoffs suggests that the losses are significant and long-lasting, especially for those previously employed in unionized industries or occupations (Jacobson, LaLonde, and Sullivan 1993).

The Level of Investment Needed to Reduce the Current Levels of Wage Inequality

There have been many proposals for investments in human capital designed to increase the wage levels of the less-skilled. An investment generally yields returns over many years after initial costs are incurred. For human capital, a round, and roughly correct, average rate of return

is 10 percent. Thus, for each \$10 invested in a person, the expected annual return is \$1. Some claim that this number is lower and some claim that it is higher, but most economists would accept a 10 percent return as a good starting point for estimating the aggregate investment needed to upgrade the skills of the low-skilled segment of the workforce.

At this rate of return, to add \$1,000 in earnings per year to the average person it is necessary to make a one-time investment of \$10,000 in that person. Using a 10 percent rate, the investment needed to reduce any wage gap is ten times the amount of the gap.

To put the magnitude of recent developments in the labor market in perspective, consider the following two questions:

1. How much would we have to invest in our workforce in 1989 dollars to restore real earnings of male high school dropouts and graduates to their real 1979 levels?

This question is meaningful only for men because real weekly earnings for women have risen or remained roughly constant over the period 1979-1989. A second question is:

2. How much would we have to invest in our workforce in 1989 dollars to restore 1979 earnings ratios between lower-education groups and college graduates, without reducing the 1989 earnings of college graduates?

Using a 10 percent rate of return, it would require an investment of \$25,000 in each high school dropout or a staggering \$214 billion in 1989 dollars to restore male high school dropouts participating in the workforce to their 1979 real earnings level. To restore all high school graduates to their real 1979 *levels* would take an investment of \$10,000 per high school graduate, or more than \$212 billion 1989 dollars, for a total of \$426 billion in 1989 dollars.

The answer to question 2 is even larger. Table 1 shows the amount needed to restore the 1979 earnings ratio between high school graduates or high school dropouts and college-educated full-time workers over age 25. To restore real earnings for both male and female workers over age 25 who are high school-educated or less to their 1979 *relative* positions with respect to college graduates (holding the latter at 1989 real wage levels) would require an investment of more than 1.66 tril-

lion dollars. These cost estimates are optimistic because they do not consider persons below age 25 or persons who do not participate in the workforce at the current wage levels. They are also optimistic for another reason: few, if any, government training programs have returns anywhere near 10 percent. Zero percent is a much closer approximation to the true return.

One might wish to qualify these calculations in many ways. One might want to adjust down the rate of return as more difficult-to-train persons receive training. Or, one might wish to account for the fact that as persons have their skills upgraded, the real wages of the lower-skill workers are likely to increase as they become more scarce and the real wages of those with higher skills are likely to decrease as their supply increases. Still, under most plausible scenarios, the costs of restoring skill parities to their 1979 levels are huge.

Investment in human capital may still not reduce income inequality. Raising the skills of a few need not reduce overall inequality. By moving some workers from low-skill to high-skill status, some standard measures of earnings inequality might actually increase. Many programs train only the high end among the low-skill workers. Such training efforts could polarize the labor market. In addition, *it takes skilled labor to produce skilled labor*. A large-scale increase in training activity might therefore *increase* earnings inequality in the short run since it would further expand the demand for skilled labor to train the unskilled labor.

Finally, the most efficient training policy may not be to train the unskilled. As first noted by Jacob Mincer (1962), there is strong evidence that those who complete more school invest more in postschool training. It may be economically efficient to invest in higher-skilled workers and to alleviate concerns about income and earnings inequality through income transfers or through wage subsidies. However, to the extent that working fosters socially desirable values among those who work, it may still be desirable to invest inefficiently or subsidize the employment of low-skill workers in order to promote those values.

Table 1. Investment in Human Capital Required to Restore Earnings to 1979 Levels and to Restore 1979 Relative Wage Ratios Using a 10 Percent Rate of Return
(in billions of dollars)

To Restore Earnings to 1979 Levels	
Males	
Investment needed to restore average male high school dropout earnings in 1989 to average real earnings of male high school dropouts in 1979	\$214
Investment needed to restore average male high school graduate earnings in 1989 to average real earnings levels of male high school graduates in 1979	\$212
TOTAL	\$426
To Restore 1979 Earnings Ratios	
Males	
Investment needed to restore average male high school dropout earnings in 1989 to the level needed to achieve the 1979 high school dropout/college earnings ratio (holding 1989 college graduate wages fixed)	\$382
Investment needed to restore average male high school graduate earnings in 1989 to the level needed to achieve the 1979 high school graduate/college earnings ratio (holding 1989 college graduate wages fixed)	\$770
Females	
Investment needed to restore average female high school dropout earnings in 1989 to the level needed to achieve the 1979 high school dropout/college earnings ratio (holding 1989 college graduate wages fixed)	\$136
Investment needed to restore average female high school graduate earnings in 1989 to the level needed to achieve the 1979 high school graduate/college earnings ratio (holding 1989 college graduate wages fixed)	\$378
TOTAL	\$1.66 Trillion

SOURCE: Wages are from Blank (1994).

NOTE: We assume workers work 50 weeks a year. The figures on the educational breakdown for the labor force are from Table #616, *Statistical Abstract of the United States, 1992*. We delete all persons out of the labor force and those less than age 25. On these criteria, our estimated investment costs are downward-biased.

The Ineffectiveness of Public Training Programs

In this section, I examine the evidence concerning the rate of return to government training. The evidence suggests that the 10 percent rate of return assumed in the above calculations is wildly optimistic. Few programs earn anywhere near this return.

The Summer Youth Employment and Training Program

It has been proposed that the Summer Youth Employment and Training program under the Job Training Partnership Act be increased. The stated purpose of this program is to preserve and upgrade the skills of low-income youth during the summers between school terms. The new twist on this program is that an "investment" argument has been given to support it. Barbara Heyns and her associates have argued that knowledge acquired in schools deteriorates through disuse during the summer (Heyns 1987). The new proposals recognize this possibility and suggest that summer youth programs should be enhanced by learning enrichment activities. What are the prospects for success of this program? A recent evaluation of a similar effort, the Summer Training and Education Program (STEP), has been presented by Public/Private Ventures, a Philadelphia-based nonprofit corporation that evaluates and manages social policy initiatives aimed at helping disadvantaged youth. STEP offered two summers of employment, academic remediation, and a life skills program to low-achieving youth ages 14 and 15 from poor families. The objective of the program was to reach youth at the crucial ages at which they are deciding whether or not to drop out of school or become pregnant. Part-time summer work at the minimum wage was supplemented with remedial reading and math classes and courses on the long-term consequences of drug use, unprotected sex, and dropping out of school.

Using randomized trials, 4,800 youth in five cities were enrolled into or randomized out of the program. Both treatments and controls were followed for eight years. A high quality evaluation was conducted using state-of-the-art demonstration methods for three cohorts of participants. The findings from this evaluation are disappointing. STEP participants experienced measured short-run gains including increases of half a grade level in their math and reading competency test scores.

These gains held up even after 15 months, though gains in the second summer were less than those in the first. Especially large was short-run growth in knowledge of contraceptive methods.

This short-term promise did not translate into longer-term gains. Three-and-a-half years after their STEP experience, at the ages of 17 and 18, work rates and school completion rates were identical and low for treatments and controls. Some 22 percent of young women had children and 64 percent of these were receiving public assistance in some form (Walker and Viella-Velez 1992).

Since STEP is, if anything, more intensive than the proposed summer youth programs, this evidence suggests that summer youth programs are *not* efficient investments. There is no evidence that they have lasting effects on participants. They may protect the peace, prevent riots, and lower the summer crime rate, but there is no firm evidence of such effects.

Evidence About Conventional Workforce Training and Work-Welfare Programs

How effective are current programs in moving people from welfare to work and in increasing their employment and earnings? Robert LaLonde recently addressed this question (LaLonde 1992). His evidence is summarized below along with my own evidence on the Job Training Partnership Act (JTPA).

Adult Women

Employment and training programs increase the earnings of adult female AFDC recipients. Earnings gains (a) are modest, (b) persist over several years, (c) arise from several different treatments, and (d) are sometimes quite cost effective. Table 2 displays evaluation results for a variety of programs. For example, participation in an Arkansas job search program was required for AFDC recipients with children over age three. Participants attended a group job search club for two weeks and then were asked to search as individuals for an additional two months. A program in San Diego required all AFDC participants to take job search assistance and mandated work experience. The gains were high for participants in both programs. The National Supported Work program provided intensive training and job search assistance at

Table 2. Experimental Estimates of the Impact of Employment and Training Programs on the Earnings of Female Welfare Applicants and Recipients

		Annual earnings gain (loss) after:	
Services tested/demonstration	Net cost per participant	1 Year	3 Years
Job Search Assistance:			
Arkansas	140	220**	410**
Louisville (WIN-1)	170	350**	530**
Cook County, IL	190	10	NA
Louisville (WIN-2)	280	560**	NA
Job Search Assistance and Training Services:			
West Virginia	320	20	NA
Virginia Employment Services	520	90	330*
San Diego I (EPP/EWEP)	770	600**	NA
San Diego II (SWIM)	1,120	430**	NA
Baltimore	1,160	190	630**
New Jersey	960	720*	
Maine	2,450	140	1,140
Work Experience and Retraining:			
AFDC Homemaker-Health Care	11,550	460**	NA
National Supported Work	16,550	460**	810**

SOURCES Gueron and Pauly (1991, pp. 15-20), Bell et al (1987, tables 3 and 4), Couch (1992, table 1)

NOTE All figures in the table are expressed in 1990 dollars.

*Statistically significant at a 10 percent level.

**Statistically significant at a 5 percent level.

a cost of about \$16,550 per recipient. The estimated rate of return to this program was only 3.5 percent.

The results from the recent experiment evaluating the Job Training Partnership Act (shown in table 3) corroborate these findings. The largest impacts are for adult women, many of whom were collecting AFDC during their participation in JTPA. The impacts are not sufficiently large to move more than a tiny fraction of women out of poverty. As a general rule, conventional employment and training programs are often cost effective for adult women (especially if the opportunity cost of trainee time is ignored or is sufficiently low), but do not produce dramatic changes in participant earnings.

Table 3. Impacts on Total 18-Month Earnings and Employment: JTPA Assignees and Enrollees, by Target Group

Impact on:	Adults		Out-of school youths	
	Women	Men	Female	Male
Per assignee				
Earnings				
In \$	\$ 539 ^{* *}	\$ 550	\$ -182	\$ -854 ^{* *}
As a %	7.2%	4.5%	-2.9%	-7.9%
Percentage employed	2.1% ^{* *}	2.8 ^{**}	2.8	1.5
Sample size (assignees and control group combined)	6,474	4,419	2,300	1,748
Per enrollee				
Earnings				
In \$	\$ 873 ^b	\$ 935 ^b	\$ -295 ^b	\$ -1,355 ^b
As a %	12.2%	6.8%	-4.6%	-11.6%
Percentage employed ^a	3.5 ^b	4.8 ^b	4.5 ^b	2.4 ^b

SOURCE: Bloom et al (1993) Enrollee estimates obtained using the procedure in Bloom (1984)

a At any time during the follow-up period

b. Tests of statistical significance were not performed for impacts per enrollee.

*Statistically significant at the .10 level, **at the .05 level, ***at the .01 level (two-tailed test).

Adult Men

The evidence for this group is consistent across programs. Returns are low but usually positive. Job search assistance is an effective strategy but produces only modest increases in mean earnings levels. This program is worth keeping but I do not think that it will make much of a difference in closing the emerging wage gap.

Youth

Evidence from the JTPA experiment indicates that this program produces only low or negative impacts on earnings. For male youth, the estimated negative effect is unbelievably low. If taken seriously, participation in JTPA has a more negative impact on the earnings of male youth than participation in the Army, loss of work experience, or the cost of incarceration as measured by many studies.

Only the Job Corps has a demonstrated positive impact on earnings. It is an expensive program, costing around \$20,000 per participant, with an estimated return of roughly 8-9 percent. There is some basis for supporting expansion of this program, but even for this program the evidence is weak. The evaluation of Job Corps program is not experimental. Part of the high return comes from the very large value imputed to human life and the slightly smaller rate of committing murders found among persons who participate in the Job Corps. With lower values placed on lives saved, the gains from Job Corps tend to weaken greatly. (See Donohue and Siegelman 1995).

Workfare and Learnfare

How effective are the recent learnfare and workfare programs? An evaluation of two programs conducted in Wisconsin is of interest (see Pawasarat and Quinn 1993). One program, the Community Work Experience Program (CWEP), required mandatory participation in unpaid community service jobs for nonexempt AFDC participants. A second program, Work Experience and Job Training, provided AFDC clients with assessment, job search activities, subsidized employment, job training, and community work experience. Participants who failed to find employment after completing their education and training were also required to participate in CWEP jobs.

Using randomized trials for one county and nonexperimental methods for the rest, researchers found *no effect* of these programs compared to existing program alternatives. The reduction in AFDC participation that is widely cited as a consequence of these programs is essentially due to the improvement in the Wisconsin economy during the time the programs were in place. These results are disappointing but consistent with previous studies of the efficacy of such programs by the Manpower Demonstration Research Corporation (Gueron and Pauly 1991). Mandatory work experience programs produce little long-term gain. No cheap training solution has yet been found that can end the welfare problem. Lifting a welfare woman out of poverty by increasing her earnings by \$5,000 per year (\$100 per week) will cost *at least* \$50,000. This is the scale of required investment. No “quick fix,” low-cost solution is in sight.

Training Programs for Displaced Workers

As noted above, displacement of older workers with substantial experience in the labor market has become an increasingly important phenomenon in recent years. In response to this trend, Congress passed Title III of the Job Training Partnership Act in 1982 and the Economic Dislocation and Worker Adjustment Assistance Act in 1988.

Although studies evaluating these programs directly are not available as yet, evaluations of state-funded programs providing a similar mix of services have been conducted. Leigh (1990) summarizes the evidence on a variety of these programs. Results from some of these evaluations suggest small to moderate wage gains lasting only about a year. A more recent evaluation by Mathematica (see Corson et al. 1993) of training provided under the Trade Adjustment Assistance Act to workers displaced as a result of foreign trade finds no evidence of any effect of this long-term training program on the earnings and employment of recipients. Consistent with the other studies of government employment and training programs already discussed, the overall pattern for programs aimed at displaced workers is one of weak impacts for most groups.

Private Sector Training

Due to a lack of data and a bias in favor of funding studies of government training, the returns to private sector training are less well understood. Studies by Lynch (1992) and Lillard and Tan (1986), find sizable effects of private sector training. In comparison with studies of public sector training, most of these studies do not attempt to control for the likely case that more able persons are more likely to take training, so the estimated rates of return would overstate the true returns to training by combining them with the return to ability. Thus, part of the measured return may be due to more motivated and able persons taking training. Estimated initial returns range from 10 to 20 percent (Mincer 1993), but they tend to decline after a few years as technical progress renders the training essentially obsolete. To the extent that rapid technical progress in many fields causes the knowledge obtained through training to lose its value after only a few years, fears about the detrimental effects of turnover in the labor market on the volume of human capital investment may be exaggerated.

An important feature of private sector training is that the more skilled do more investing even after they attain high skill levels. Different types of training and learning have strong complementarities with respect to each other.

Even though the evidence is weak, the direction of the evidence is clear. To the extent that effective training can be produced on the job, it is produced in the private sector and not in the public sector. The best hope of getting reasonable returns from job training is to encourage private sector investment.

It is important to note, however, that private sector training typically excludes low-skilled persons. Firms can be exclusive in a way that government training programs for disadvantaged workers are designed not to be. The lack of interest of private firms in training disadvantaged workers indicates the difficulty of the task and the likely low return to this activity. Training programs are an inefficient transfer mechanism and an inefficient investment policy for low-skill adult workers.

The Conflict Between Economic Efficiency and the Work Ethic

To the extent that there are strong complementarities between different types of skill investments, there is a conflict between policies that seek to alleviate poverty by investing in low-skill workers and policies that raise the wealth of society at large. Taking the available evidence at face value, the most economically justified strategy for improving the incomes of the poor is to invest more in the highly skilled, tax them, and then redistribute the tax revenues to the poor. However, many people view the work ethic as a basic value and would argue that cultivating a large class of transfer recipients would breed a culture of poverty and helplessness.

If value is placed on work as an act of individual dignity, because of general benefits to families, communities, and society as a whole, then all individuals in society may be prepared to subsidize inefficient jobs. Job subsidies are not, however, the same as investment subsidies. The evidence points strongly to the inefficiency of subsidizing the investment of low-skill, disadvantaged workers. Investment may have some additional nonpecuniary returns. In this case, a purely economic evaluation of investment policies may be inappropriate. If, however, economically inefficient investments are to be made, the cost of reducing the skill gap grows beyond the already enormous sums presented in table 1.

The Quality of the Evidence on Credit Constraints and Participation in Schooling and Training Programs

The evidence cited by advocates of training programs that persons from low-income families have high rates of return to schooling leads them to conclude that credit market restrictions are important factors in generating schooling and training outcomes. Another interpretation is possible, however. Family income as measured in those studies is a proxy for a whole range of background factors—not just short-term liquidity constraints that might be eased by more generous fellowship policies. Persons from poor family backgrounds may attain fewer years

of schooling because of diminished family motivation for child learning and because family background may affect the child's learning ability. Given diminishing returns to schooling, it is not surprising that marginal rates of return are higher for persons who have fewer years of school. At issue is what family income really represents. It is significant in this regard that Murray and Herrnstein (1994) find that after they control for the effects of a score on a combined achievement and ability test, measured family income plays only a small role in explaining schooling attainment. It appears that longer-term factors such as family background that produce the test score are more important.

Alternative Policy Recommendations: Choice in Schools, Tax Policy Wage Subsidies and Antitrust Policy

In the long run, significant improvements in the skill levels of American workers, especially workers not attending college, are unlikely without substantial change and improvement in primary and secondary education. Mincer's evidence that learning begets learning demonstrates the value of early training in making subsequent training effective. Much of the recent discussion about improving postsecondary education is misplaced when the value of early schooling is put in context.

Methods for improving primary and secondary education receive much attention in current policy discussions but are treated as completely separate issues in discussions of traditional training programs. Increasing the extent of consumer choice in the educational system would help to realign incentives in the right way to produce more effective schools. Choice among secondary training vendors is an important aspect of the German apprenticeship system. (See Heckman, Roselius and Smith 1994). Advocates of strong government activity in the training area do not consider the failure of governments to provide adequate skills to students.

Current tax rules tend to promote human capital formation (see Quigley and Smolensky 1990). However, there is much evidence that they discriminate against low-skill and disadvantaged workers. Firms can immediately write off all of their training expenditures. They do

not have to be amortized like investments in physical capital. This favors investment in human capital over physical capital. In addition, training expenditures can include tuition paid by employers for each employee up to \$5,250 per year, though tuition support is restricted to undergraduate level education (U.S. House of Representatives, Joint Committee on Taxation 1992). Since many community colleges qualify as undergraduate institutions, there is an incentive for firms to sponsor vocational training. The bias in the tax code favors vocational training over academic education.

Because tuition paid by employers is exempt from federal personal income tax, individuals have an incentive to seek training on the job. Additionally, portable vocational or employer-based training can be sold to employees by firms and paid for by lower wages. The forgone higher earnings are *de facto* written off on personal income taxes. To the extent that direct costs of books and educational materials are paid for by lower wages, current tax laws favor on-the-job training activities over off-the-job training activities. Thus, they act to shift human capital investment activity away from formal schools and toward workplace environments.

Conversely, individuals cannot write off direct tuition costs for formal schooling if it is not expressly job-related. Write-offs are not given for training in skills useful in other jobs. Thus workers training to switch occupations cannot write off their educational expenses for this activity. Moreover, there is a floor level of training and education expenditures that must be met before persons can write off such self-investment activity. To be eligible for this tax break, it is necessary to itemize deductions and to incur training costs that exceed 2 percent of adjusted gross income. This tax policy likely biases human capital accumulation toward vocational over academic training, because vocational training is typically more narrowly defined and justifiable.

Since 1986, persons have been unable to deduct interest on educational loans from their taxable income. This removes an important incentive that promotes investment in human capital of all forms (Heckman 1976). However, since mortgage interest is still deductible, it is possible for persons with home equity to take out mortgages to finance their education or that of their children or to rearrange their portfolios toward mortgage debt in order to finance educational loans.

The tax code for individuals favors human capital accumulation for higher income persons (and their children) who itemize their taxes and have equity in their homes. Low-income persons who pay no taxes receive little encouragement to invest in human capital from the current personal tax code. However, firms that employ them may write off training expenditures devoted to them. The personal tax code thus encourages low-skill workers to make training investments on the job. It does not encourage investment in general skills or academic education except for company tuition programs. Unfortunately, these programs (defined under section 127 of the 1988 Tax Code) have not received consistent treatment by the tax authorities. In recent years, companies have operated under uncertainty whether or not section 127 would apply to them in a given tax year. Tax policy is an attractive option that should receive more discussions in future policy discussion about stimulating skill formation.

The evidence on government training programs previously summarized suggests that they can make at best only a modest contribution to aggregate human capital formation. Given the strong evidence of complementarity between schooling and training, it may be more efficient to focus training on high-skill workers, and then use the tax system to transfer resources to the less-skilled through wage subsidies or inefficient investment. If the goal is to raise their incomes, the extra surplus generated through more efficient investment can more than compensate low-skilled workers for the training they forgo.

Support of cooperative activity among employers could allow firms within an industry to overcome free rider problems in the provision of general training by contracting to provide similar levels of industry-specific training or general training to their employees. This suggests a role for antitrust policy that is rarely mentioned in discussions of training strategy.

A Life-Cycle Perspective

Economic theory demonstrates that the returns to human capital investments are greatest for the young. This is so for two reasons: (1) younger persons have a longer horizon over which to recoup the fruits

of their investments, and (2) skill begets skill. Early learning facilitates later learning. At the same level of ability, it pays to invest in the young.

Surprisingly little empirical evidence is available on the returns to early childhood investments. Early childhood interventions of high quality appear to have lasting effects. Despite very small samples, disadvantaged subnormal children randomly assigned to the Perry Pre-school program have higher earnings and lower levels of pathological behavior in their late twenties than do comparable children randomized out of the program. (See Schweinhart, Barnes and Weikart 1993). Reported cost-benefit ratios are substantial. Evidence on Head Start is less clear but the program is quite heterogeneous. These programs do not boost IQ but they do appear to foster valuable social skills that enhance performance in society at large and in the workplace.

At the same time, skill remediation programs for young adults with severe educational disadvantages seem to have negligible effects as do training programs for more mature displaced workers. The available evidence clearly suggests that adults past a certain age, and below a certain skill level make poor investments. Transfers or wage subsidies to employers make more sense than investments for such persons.

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References

- Blank, R. 1994. "Employment Strategies: Public Policy to Increase the Work Force and Earnings." In *Poverty and Public Policy: What Do We Know? What Should We Do?*, S. Danziger, G. Sandfur, and D. Weinberg, eds. Cambridge, MA: Harvard University Press.
- Bloom, H., L. Orr, G. Cave, S. Bell, and F. Doolittle. 1993. "The National JTPA Study: Title II-A Impacts on Earnings and Employment at 18 Months," Abt Associates, January.
- Corson, W. et al. 1993. *International Trade and Worker Dislocation: Evaluation of the Trade Adjustment Assistance Program*, Princeton, NJ: Mathematica.
- Couch, K. 1992. "New Evidence on the Long-Term Effects of Employment Training Programs," *Journal of Labor Economics* 10, 4.
- Donohue, John, and Peter Siegelman. 1995. "Is The United States at the Optimal Rate of Crime?" American Bar Foundation.
- Gueron, Judith, and Edward Pauly. 1991. *From Welfare to Work*. New York: Russell Sage Foundation.
- Heckman, J. 1976. "A Life Cycle model of Earnings, Learning and Consumption," *Journal of Political Economy*, August.
- _____. 1981. "Heterogeneity and State Dependence", in S. Rosen (ed.), *Studies in Labor Markets*. University of Chicago Press.
- _____. R. Roselius, and J. Smith. 1994. "U.S. Education and Training Policy: A Reevaluation of The Underlying Assumptions Behind The New Consensus." In *Labor Markets, Employment Policy and Job Creation*, A. Levenson and L. C. Solmon, eds. Santa Monica, CA: Milken Institute for Job and Capital Formation, October.
- Heyns, B. 1987. "Schooling and Cognitive Development: Is There A Season For Learning?" *Child Development* 58: 1150-1160.
- Jacobson, L., R. LaLonde, and D. Sullivan. 1993. "Earnings Losses of Displaced Workers," *American Economic Review* 83, 4 (September): 685-709.
- LaLonde, R. 1992. "The Earnings Impact of U.S. Employment and Training Programs." Unpublished manuscript, University of Chicago, January 29.
- Leigh, D. 1990. *Does Training Work for Displaced Workers?* Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.
- Lillard, L., and H. Tan. 1986. *Private Sector Training: Who Gets It and What Are Its Effects?* Santa Monica, CA: Rand.
- Lynch, L. 1992. "Private-Sector Training and the Earnings of Young Workers," *American Economic Review* 82, 1.

- Mincer, J. 1962. "On the Job Training: Costs, Returns, and Some Implications," *Journal of Political Economy* 70, Supp. (October): 50-79.
- _____. 1993. "Investment in U.S. Education and Training." Discussion Paper 671, Columbia University, November.
- Murray, C., and R. Herrnstein. 1994. *The Bell Curve*. New York: Free Press.
- Pawasarat, J., and L. Quinn. 1993. "Evaluation of The Wisconsin WEJT/CWEP Welfare Employment Programs." Employment and Training Institute, University of Wisconsin, April.
- Phelps, E. 1994. "A Program of Low-Wage-Employment Tax Credits." Working Paper No. 55, Russell Sage Foundation, May.
- Quigley, J., and E. Smolensky. 1990. "Improving Efficiency in the Tax Treatment of Training and Educational Expenditures," *Research in Labor Economics* 11: 77-95.
- Reich, R. 1991. *Work of Nations: Preparing Ourselves for 21st-Century Capitalism*. New York: A. A. Knopf.
- Schweinhardt, L., H. Barnes, and D. Weikart. 1993. *Significant Benefits: The High/Score Perry Preschool Study Through Age 27*. Ypsilanti, MI: High Scope Press.
- U.S. House of Representatives, Joint Committee on Taxation. 1992. *Description and Analysis of Tax Provisions Expiring in 1992*. Washington, DC: Government Printing Office.
- Walker, G., and F. Viella-Velez. 1992. *Anatomy of A Demonstration*. Philadelphia: Public and Private Ventures.